SEQUENCE LISTING

- <110> The Curators of the University of Missouri
- <120> LARGE SCALE EXPRESSION AND PURIFICATION OF RECOMBINANT PROTEINS
- <130> UMO1531.1
- <140>
- <141>
- <150> 60/218,125
- <151> 2000-01-13
- <160> 2
- <170> PatentIn Ver. 2.1
- <210> 1
- <211> 4087
- <212> DNA
- <213> Bos taurus
- <220>
- <221> CDS
- <222> (268)..(3180)
- <220>
- <221> sig_peptide
- <222> (268)..(363)
- <220>
- <221> misc feature
- <222> (3178)
- <223> A Poly (H) affinity tag comprising 6 His residues have been inserted at the C-Terminus end of the coding region of the protein
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- ggcgaacatc aactcgtgct tgaaaaatac caacttggag cccggtttga gaagctacat 180
- cagagteteg agatgegacg etacaatetg cagtttteae tagetteeca gtaggttggg 240

acag	gttgg	gaa d	etete	gccat	t go	eccas	gc at	tg c	tg ca	ag t	tc a	gt c	tg	tca	CC	c acc	294
							Me	et Le	eu G	ln P	he S	er L	eu	Ser	Pr	o Thr	
								1				5					
ttg	tcg	atg	gga	ttt	cac	gtg	ata	gcc	atg	gtg	gct	ctc	: tt	g t	tt ·	tcc	342
Leu	Ser	Met	Gly	Phe	His	Val	Ile	Ala	Met	Val	Ala	Leu	Lе	u P	he :	Ser	
10					15					20						25	
cat	ata	qac	cat	ata	agt	act	gag	aca	σaa	atq	gaa	qqa	ι σa	a q	3C (aac	390
		_			_	_			_	_	Glu		_		_		
	-			30					35						40		
дад	act	aac	gag	tat	act	aac	tcc	tat	tac	tat	aag	aac	ι σα	a a	tar i	att	438
				_						_	Lys	_			-		
		1	45	-2.5		2		50	-1-	-1-	-1-	2		5			
								50					-	•			
++=	000	att	taa	ana a	000	cac	a a a	cat	taa	+++	gga	a a a			++ <i>i</i>	act	486
						_	_					_				_	100
neu	PIO		IIP	GIU	PIO	GIH	_	PIO	ser	Pne	Gly	_	_	B I.	re .	нта	
		60					65					70	,				
																	E 2.4
_							_	_	_		atg					_	534
Arg		Thr	Val	Tyr	Pne		Ala	Met	vaı	Tyr	Met	Pne	: те	u G.	гĀ	vaı	
	75					80					85						
			-	-			_				gaa ~-	_			-		582
	IIe	IIe	Ala	Asp	_	Phe	Met	Ser	ser		Glu	vaı	. II	e T			
90					95					100						105	
			_				_				gga					_	630
Gln	Glu	Lys	Glu		Thr	Ile	Lys	Lys		Asn	Gly	Glu	Th			Lys	
				110					115					13	20		
											aac						678
Thr	Thr	Val		Ile	Trp	Asn	Glu		Val	Ser	Asn	Leu	ı Th	r L	eu 1	Met	
			125					130					13	5			
gcc	ctg	aaa	tct	tca	gct	cca	gag	att	ctc	ctt	tca	gta	at	c g	ag (gtg	726
Ala	Leu	Gly	Ser	Ser	Ala	Pro	Glu	Ile	Leu	Leu	Ser	Val	. Il	e G	lu '	Val	
		140					145					150)				
tgt	ggc	cat	aac	ttc	act	gca	gga	gac	ctt	ggc	cct	ago	ac	c a	tc :	gtg	774
Cys	${\tt Gly}$	His	Asn	Phe	Thr	Ala	Gly	Asp	Leu	Gly	Pro	Ser	Th	r I	le '	Val	
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Gly	Ser	Ala	Ala	Phe	Asn	Met	Phe	Ile	Ile	Ile	Ala	Leu	ι Су	s V	al '	Tyr	
170					175					180						185	

		ccg Pro														870
		aca Thr	_	_		_			_							918
	_	tct Ser 220	_	-				_			_		_		_	966
		ttc Phe						_	_			_				1014
-		agg Arg		_			_		-		_				_	1062
	_	cag Gln			_			_		_		_				1110
	_	aca Thr	_													1158
_	_	ttc Phe 300		_		_	_	_	_	_						1206
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	_	cag Gln	_				_	_								1302
_		tac Tyr		_		_	_	_								1350
_		caa Gln	_		_	_	_			_					_	1398

	cat His	_	_	_		_			-	_	_				_	1446
	acg Thr 395	-		-	_		_		_	-	-				_	1494
	G1 ^A aaa			_	_	_			_			_	_	_		1542
	atc Ile	_	-													1590
_	aca Thr		_			_		_			_		-			1638
	gga Gly			_		_						_		_	_	1686
-	ggc Gly 475			_	-	_					_					1734
	cat His		_		_		_		_	_	_	_	_	-		1782
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	act Thr															1878
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	tat Tyr											-		_		2022
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	ata Ile		_	_	_		_	_							_	2118
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	tac Tyr	_			_		_				-		_	_	_	2262
	cca Pro									_	_	_		_	_	2310
_	cag	cca														
	Gln	Pro	_		_				•			_			_	2358
_	Gly gga	Pro cgc	Leu 685	Thr	Ser	Lys gga	Glu gag	Glu 690 cac	Glu	Glu	Arg	Arg gag	Ile 695 gtg	Ala	Glu	2358 2406
Met gaa	ggg	Pro cgc Arg 700	Leu 685 ccc Pro	Thr att Ile gag	Ser ctg Leu	Lys gga Gly aag	Glu gag Glu 705	Glu 690 cac His	Glu acc Thr	Glu aga Arg	Arg ctg Leu	Arg gag Glu 710 ctg	Ile 695 gtg Val	Ala atc Ile	Glu att Ile	
Met gaa Glu aca	ggg Gly gaa Glu	cgc Arg 700 tcc ser	Leu 685 ccc Pro tac Tyr	Thr att Ile gag Glu	ser ctg Leu ttc Phe	gga Gly aag Lys 720	gag Glu 705 agt Ser	Glu 690 cac His acc Thr	Glu acc Thr gtg Val	Glu aga Arg gac Asp	Arg ctg Leu aaa Lys 725	gag Glu 710 ctg Leu	Ile 695 gtg Val att Ile	Ala atc Ile aag Lys cag	Glu att Ile aag Lys	2406

_				_	_			-		-			•	cac His		2598
-					_	_			_		_		_	aca Thr		2646
						•			•				_	atc Ile		2694
	_	_	_				_		_				_	tgc Cys		2742
														ctt Leu 840		2790
_				-				_					_	cag Gln	_	2838
_			_	_					-			-		gcg Ala		2886
	_		_					_				_		atc Ile		2934
		-			-	_							_	cta Leu	-	2982
		_							_					ggg Gly 920		3030
							_					_		ggg Gly		3078
		_	_					_					_	tgg Trp		3126

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Leu	Tyr	Ile	Phe	Phe	Ser	Ser	Leu	Glu	Ala	Tyr	Cys	His	Ile	Lys	Gly	
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970

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<212> PRT

<213> Bos taurus

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Ser	Tyr 50	Tyr	Cys	Lys	Lys	Gly 55	Val	Ile	Leu	Pro	Ile 60	Trp	Glu	Pro	Gln
Asp	Pro	Ser	Phe	Gly	Asp	Lys	Ile	Ala	Arg	Ala	Thr	Val	Tyr	Phe	Val
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Ala	Met	Val	Tyr	Met 85	Phe	Leu	Gly	Val	Ser 90	Ile	Ile	Ala	Asp	Arg 95	Phe
Met	Ser	Ser	Ile	Glu	Val	Ile	Thr	Ser	Gln	Glu	Lys	Glu	Ile	Thr	Ile
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Lys	Lys	Pro	Asn	Gly	Glu	Thr	Thr	Lys	Thr	Thr	Val	Arg	Ile	Trp	Asn
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Glu	Thr	Val	Ser	Asn	Leu	Thr	Leu	Met	Ala	Leu	Gly	Ser	Ser	Ala	Pro
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Glu	Ile	Leu	Leu	Ser	Val	Ile	Glu	Val	Cys	Gly	His	Asn	Phe	Thr	Ala
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Gly	Asp	Leu	Gly	Pro	Ser	Thr	Ile	٧al	Gly	Ser	Ala	Ala	Phe	Asn	Met
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Phe	Ile	Ile	Ile	Ala	Leu	Cys	Val	Tyr	Val	Val	Pro	Asp	Gly	Glu	Thr
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Arg	Lys	Ile	Lys	His	Leu	Arg	Val	Phe	Phe	Val	Thr	Ala	Ala	Trp	Ser
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Ile	Phe	Ala	Tyr	Thr	Trp	Leu	Tyr	Ile	Ile	Leu	Ser	Val	Ser	Ser	Pro
	210					215					220				
Gly	٧al	Val	Glu	Val	Trp	Glu	Gly	Leu	Leu	Thr	Phe	Phe	Phe	Phe	Pro
225					230					235					240
Ile	Cys	Val	٧al	Phe	Ala	Trp	Val	Ala	Asp	Arg	Arg	Leu	Leu	Phe	Tyr
				245					250					255	
Lys	Tyr	Val	Tyr	Lys	Arg	Tyr	Arg	Ala	Gly	Lys	Gln	Arg	Gly	Met	Ile
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Ile	Glu	His	Glu	Gly	Asp	Arg	Pro	Ser	Ser	Lys	Thr	Glu	Ile	Glu	Met
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Asp	Gly	Lys	Val	Val	Asn			Val	Asp	Ser		Leu	Asp	Gly	Ala
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Leu	Val	Leu	Glu	Val		Glu	Arg	Asp	Gln	-	Asp	Glu	Glu	Ala	_
305					310					315					320
Arg	Glu	Met	Ala	_	Ile	Leu	Lys	Glu		Lys	Gln	Lys	His		Glu
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Lys	Glu	Ile	Glu	Gln	Leu	Ile	Glu		Ala	Asn	Tyr	Gln		Leu	Ser
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Gln	Gln		Lys	Ser	Arg	Ala		Tyr	Arg	Ile	Gln		Thr	Arg	Leu
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Met		Gly	Ala	Gly	Asn		Leu	Lys	Arg	His		Ala	Asp	Gln	Ala
	370					375			_		380				_
	Lys	Ala	Val	Ser		His	Glu	Val	Asn		Glu	Val	Ala	Glu	
385	_		_	_	390			~-	 -	395		_	~-	_	400
Asp	Pro	val	Ser	ьуs	тте	Phe	Phe	Glu	GIn	GLY	Thr	Tyr	GIN	Cys	ьeu

					405					410					415	
G	:1 ₁₃	Asn	Cvs	Gly		Val	Δla	T.e.	Thr		Tle	Δra	Δrσ	G] v		Agn
Ī			O ₂ D	420		741			425			9	9	430	O-y	nop.
т	.e:11	Thr	Δan	Thr	Val	Dhe	Wa I	Δen		Δτα	Thr	Gl 11	Δen		Thr	Δla
**			435				val	440	1110	n. g		<u> </u>	445	GLY		nia
Δ	gn	Δla		Ser	Asn	Tvr	Gl 11		Thr	G111	G] v	Thr		Val	Dhe	Targ
•		450	G.r.y	Der	пор		455	1110	T.11.	GIU	GIY	460	Val	Vai	FIIG	цур
P	ro		G111	Thr	Gl n	Tivs		Tle	Ara	Val	Glv		Tle	Asn	Asn	Asn
	65	0-1			· · · · ·	470			9	,	475				E	480
		Phe	Glu	Glu	Asp		Asn	Phe	Leu	Val		Leu	Ser	Asn	Val	
					485					490					495	-2-
v	al	Ser	Leu	Glu	Ala	Ser	Glu	Asp	Glv		Leu	Glu	Ala	Ser		Val
				500				•	505					510		
S	er	Thr	Leu	Ala	Cys	Leu	Gly	Ser	Pro	Ser	Thr	Ala	Thr	Val	Thr	Ile
			515		_		-	520					525			
P	he	Asp	Asp	Asp	His	Ala	Gly	Ile	Phe	Thr	Phe	Glu	Glu	Pro	Val	Thr
		530	_	_			535					540				
H	lis	Val	Ser	Glu	Ser	Ile	Gly	Ile	Met	Glu	Val	Lys	Val	Leu	Arg	Thr
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S	er	Gly	Ala	Arg	Gly	Asn	Val	Ile	Val	Pro	Tyr	Lys	Thr	Ile	Glu	Gly
					565					570					575	
T	'hr	Ala	Arg	Gly	Gly	Gly	Glu	Asp	Phe	Glu	Asp	Thr	Cys	Gly	Glu	Leu
				580					585					590		
G	lu	Phe	${\tt Gln}$	Asn	Asp	Glu	Ile	Val	Lys	Thr	Ile	Ser	Val	Lys	Val	Ile
			595					600					605			
A	sp	Asp	Glu	Glu	Tyr	Glu	Lys	Asn	Lys	Thr	Phe	Phe	Leu	Glu	Ile	Gly
		610					615					620				
G	lu	Pro	Arg	Leu	Val	Glu	Met	Ser	Glu	Lys	Lys	Ala	Leu	Leu	Leu	Asn
	25					630					635					640
G	lu	Leu	Gly	Gly		Thr	Ile	Thr	Gly	_	Tyr	Leu	Tyr	Gly		Pro
					645					650					655	
V	al	Phe	Arg	_				_							Thr	Ile
_														670		
1	le	Thr		Ala	Asp	Glu	Tyr		Asp	Lys	Gln	Pro		Thr	Ser	Lys
_			675		_	_		680				_	685		_	
G	Ιu		Glu	Glu	Arg	Arg		Ala	Glu	Met	Gly	_	Pro	Ile	Leu	Gly
~		690	m1	3	-	~ 3	695			a 1	~ 1	700		~ 3	-1	
	.02	HIS	Thr	Arg	ьeu		vaı	тте	TTE	GIU		ser	ıyr	GIU	Pne	_
		m2	**- 7	7 am	T = = =	710	T1.	T	T	mb	715	T		T	77-7	720
٥	er	THE	Val	Asp	лув 725	теп	тте	тув	тух	730	ASII	теп	Ala	теп	735	Val
-	17.7	Thr	λen	gar.		7~~	G1.,	Gln.	Dho		<i>α</i> 1	77-	T10	The		Ser
٠	<u>- y</u>	1111	TOTT	740	TTD	n. g	Gru	GIII	745	116	GIU	AIG	TIE	750	vai	Ser
Δ	la	Glv	Glu		Agn	Agn	Agn	Asn		Cve	Glv	Gl 11	Glu		T,en	Pro
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S	er	Cvs		asa	Tvr	Val	Met		Phe	Leu	Thr	Val		Tro	Lvs	Val
	_	770					775					780			_, _	
L	eu		Ala	Phe	Val	Pro		Thr	Glu	Tyr	Tro		Glv	Tro	Ala	Cys
		-		_	_	-					- =		-4	- 1		- 4

785					790					795					800
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Leu	${\tt Glu}$	Ala	\mathtt{Tyr}	Cys	His	Ile	Lys	Gly	Phe						
				965					970						